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Profitability of Participation in the 1962 Feed Grain Program in the Corn Belt

U.S. DEPARTMENT OF AGRICULTURE
Economic Research Service

FOREWORD

In 1961, Congress authorized the first of a new series of farm production control programs. Participation was voluntary and at first the program applied only to feed grains. Farmers were encouraged to participate by the offer of payments for diverting part of their acreage from production to conserving uses, and by price supports and nonrecourse loans (loans that may be repaid by delivery of the grain offered as security) for the feed grain produced. Although some of the effects of the program could be anticipated, others could only be learned through experience. Unlike much of the experimentation in the physical sciences where small-scale experiments can be conducted under controlled conditions, experimentation in the social sciences, particularly programs that affect the institutional structure, require involvement of the entire society. The voluntary production control programs are of this nature.

In this report, the 1962 Feed Grain Program is analyzed. The 1963 program was modified to provide price support payments to producers and lower loan rates. This change removed most of the difference between the effective price available to participants and the market price. More recently, the program has been further modified to permit participants to divert more than the minimum acreage without losing price support payments. Also, payments are based on projected yield estimates that are closer to actual yields. Thus, the program provisions have been modified so that farmers can more accurately appraise the effects of participation on their farms.

Although programs have changed appreciably from those in effect in 1962, a report on the diverse effects of the earlier program on individual farms may help in the development of new programs that will provide the greatest benefit to farmers and consumers at minimum cost.

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SUMMARY AND CONCLUSIONS

Small changes in prices and yields caused large changes in the proportion of farmers for whom participation in the 1962 Feed Grain Program was profitable. Under conditions that prevailed in 1962, the feed grain program was profitable for only 10 percent of the participants and would have been profitable for 23 percent of the nonparticipants. One might conclude that either many farmers based their decisions on insufficient information, they miscalculated the economic benefits of participation, the situation changed between signup time and the time the crop was marketed, or farmers considered other factors more important in deciding whether to participate in the feed grain program. This conclusion is based on an analysis of 1,445 Corn Belt farms, of which 57 percent participated in the 1962 Feed Grain Program.

If the market price of corn in the Corn Belt had remained 20 cents per bushel below the support price in 1962, as it was in 1961, participation would have been profitable for 49 percent of the farms in the program in 1962. Actually, the market price of the 1962 crop averaged only 12 cents below the support level.

If fewer farmers had participated in the program, prices of feed grains probably would have risen less, or possibly declined relative to the price support loan rate, and participation would have been profitable for more farmers.

Corn yields on participants' farms averaged about 79 bushels per acre in 1962 compared with assumed normal yields averaging about 64 bushels. Farmers in the program diverted an average of 33 percent of their feed grain bases. If farmers had anticipated the higher yields and diverted the minimum 20 percent of their bases, participation would have been profitable for 82 percent of the farms in the program. This estimate assumes a 20-cent spread between market and support price.

For 83 percent of the nonparticipants, participation with minimum diversion would have been profitable, if the market price for corn had been 20 cents per bushel below the support price. However, with the market price only 12 cents below the support price, the proportion for whom participation would have been profitable dropped to 23 percent.

In more recent years, the yield estimates on which payments are made for participation in the feed grain program and the method of payments have changed, but for a large proportion of farmers, small differences between actual and expected prices and yields would affect the profitability of participation.

Net returns from participation ranged from a gain of $17 per acre of corn base to a loss of $64. This range is based on prevailing normal and actual yields and a 20-cent price differential. If the 10 percent of the farms at each end of the distribution are excluded, the difference due to participation ranged from a gain of $6 an acre to a loss of $12 an acre of corn base. On the 10 percent of farms with the largest gains, normal yields averaged 8 percent above 1962 yields. At the other end of the distribution, on the 10 percent of farms with the largest losses from participation, normal yields averaged 34 percent below 1962 yields. For both groups, returns per acre of corn base were about the same. But if all the farms in both groups had stayed out of the program, returns would have been very dissimilar for the two groups.

PROFITABILITY OF PARTICIPATION IN THE 1962 FEED GRAIN PROGRAM IN THE CORN BELT

By

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INTRODUCTION

Early in 1962, a study was made of the 1961 Emergency Feed Grain Program to determine factors that affected farmers' decisions regarding participation in the program and to provide information that would be useful in developing and operating future programs. The study, which covered eight areas, provided insight into the operation of the program in selected situations but did not make it possible to measure the effects of tenure or type of farm on participation, or the proportion of the farmers for whom participation was profitable.

This study of the 1962 Feed Grain Program in the Corn Belt was initiated to reflect program operations in a much larger region, for which data could be aggregated to represent a larger proportion of the production. The objectives of the study were to obtain more information on the characteristics of farms and farmers in and out of the program, the effect of participation on returns of individual farms, the proportion of farms for which participation would be profitable, changes in farm organization and practices associated with participation, the relation of farms and farmers' characteristics to participation, and farmers' reactions to program modification.

The 1962 Feed Grain Program

The 1962 Feed Grain Program was similar to the 1961 program. To obtain the benefits of the 1962 program, farmers were required to divert a minimum of 20 percent of their base acreage of corn and grain sorghum to conserving uses. (A farm's base acreage under the program was the average acreage of corn and grain sorghum grown in 1959 and 1960.) Payments per acre for diverting the first 20 percent of the base were equal to 50 percent of each farm's normal yield times the county support price for the crop diverted. Payments for diverting between 20 and 40 percent were at the rate of 60 percent of normal yield times support price. Payments for diverting more than 40 percent were at the 50 percent rate. The maximum diversion for payment was the entire base on farms with less than 25 acres. For farms with 26 to 100 acres of base, the maximum was 20 acres plus 20 percent of the base. For larger farms, maximum diversion was 40 percent of base acreage. The national average support prices were $1.20 a bushel for corn and $1.93 a hundredweight for grain sorghum. A farm's normal yield was the 1959-60 county average yield of the crop diverted, adjusted by an index of productivity of the farm relative to the productivity of all farms in the county.

METHOD OF STUDY

A self-weighting sample of farms was drawn from all farms with feed grain bases within the area of study (fig. 1). Both participants and nonparticipants were included in the sample. Each farm included all the land operated as a management unit, which might include one or more ownership tracts. This definition differed somewhat from the definition of a farm for purposes of the feed grain program. Although two or more ownership tracts sometimes were treated as a unit under the program, the more common arrangement was to treat each ownership tract as a separate farm.

The sample in the Corn Belt included about 0.3 percent of all eligible farms in the area surveyed. Personal interviews were conducted in 62 counties and a total of 1,445 usable questionnaires were completed. Of the farmers interviewed, 57 percent participated in the 1962 Feed Grain Program.

The distribution of farms by tenure and type of farm is shown in table 1. Farms were classified in three tenure groups according to whether all, part, or none of the land was rented for a share of the crop. Classification by type of farm was based on farmers' estimate of the usual major source of net farm income.

DESCRIPTION OF FARMS

Farms were classified by tenure in an attempt to measure the influence of landlords on the decision regarding participation. For each type of farm, participation was highest on farms where all or part of the land was rented on a crop-share basis (table 2). Participation also was higher on cash crop farms or cash crop and livestock farms than it was on chiefly livestock farms. Participation was lowest on livestock farms with no crop-share rented land. Although some tenants reported that they did not participate because their landlords objected to the program, others may have participated because their landlords urged them to do so; the need for both tenant and landlord to agree on the decision does not appear to have been a serious obstacle to participation.

Participation was lowest among livestock farms, probably because most livestock farmers needed all or most of the grain they raised to feed their livestock. Those who participated in the program and received the support prices had to deliver their grain to the Commodity Credit Corporation and buy other grain for livestock feed.

Farms in the program were larger than those of nonparticipants, they had a slightly larger proportion of their land in crops, and their feed grain bases were a substantially larger proportion of cropland (table 3). Among participants, farms that included both owned and rented land were the largest, and participation also was higher in this tenure group (see table 2). Crop-share rented farms had slightly higher normal yields than other tenure groups, but there was no significant difference among tenure groups in the ratio of 1962 yields to normal yields. Neither was there any significant difference between participants and nonparticipants in the ratios of 1962 yields to normal yields. The percentage of feed grain base diverted was highest in the "other" group, which was made up largely of owner-operated farms. This group also included the smaller

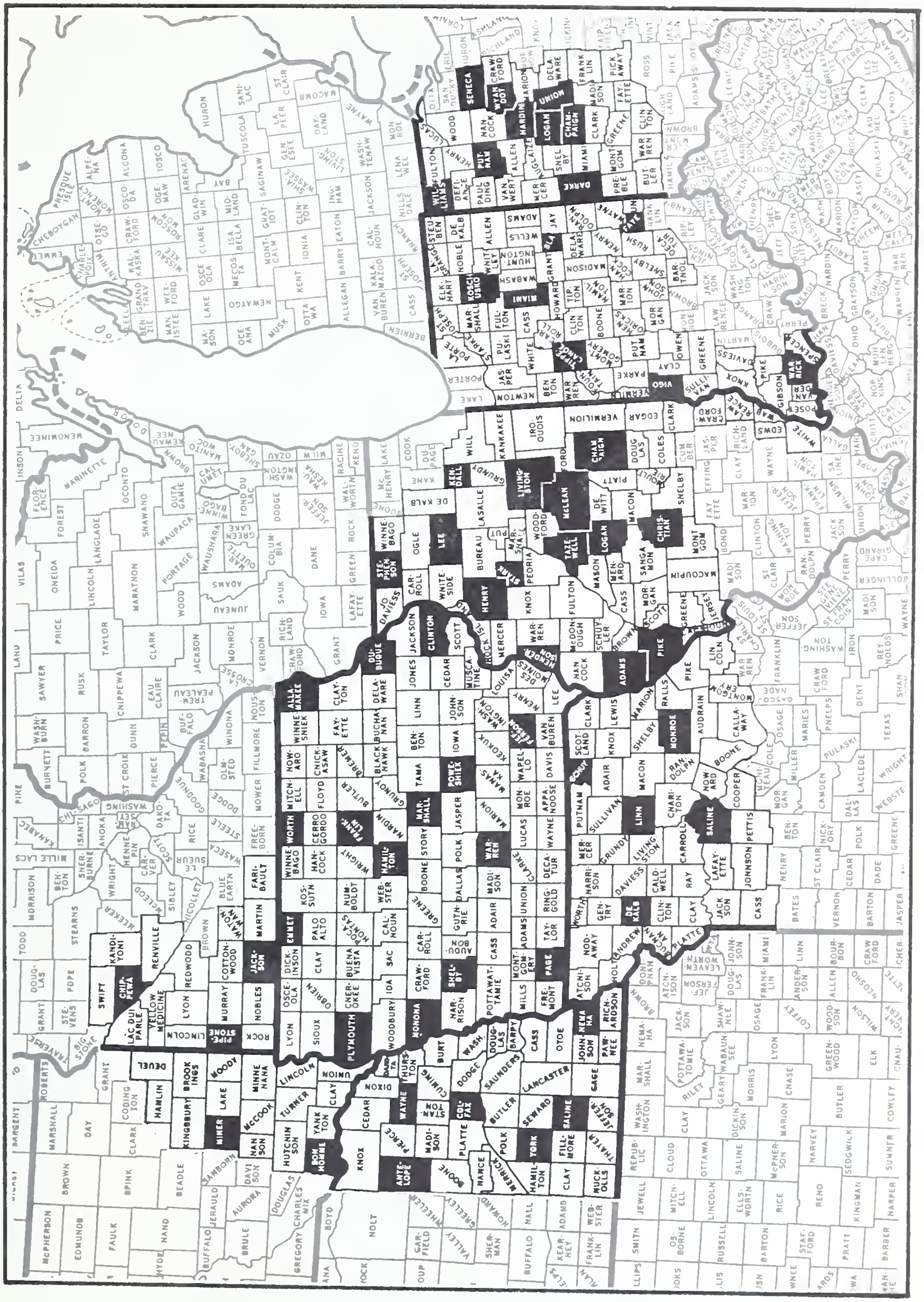

Figure 1.--Corn Belt area and counties from which sample data were drawn.

Table 1.--Distribution of participant and nonparticipant farms, by tenure and type of farm, sample farms, Corn Belt, 1962

Group	Tenure of farm			All farms
	Crop-share rented	Part crop-share rented	Other	
	Percent	Percent	Percent	Percent
Participants	15	13	29	57
Nonparticipants	8	9	26	43
	Type of farm			
	Cash crop	Live-stock	Cash crop and livestock	All farms
	Percent	Percent	Percent	Percent
Participants	20	27	10	57
Nonparticipants	8	32	3	43

Table 2.--Percentage of sample farms in Corn Belt participating in 1962 Feed Grain Program, by tenure and type of farm

Tenure	Type of farm			
	Cash crop	Cash crop and livestock	Livestock	All types
	Percent	Percent	Percent	Percent
Crop-share rented	75	83	47	64
Part crop-share rented	74	76	49	60
Other	67	69	45	52
All farms	71	75	46	57

Table 3.--Size of farm, feed grain base, yields, and diversion, by tenure of operator and participation in 1962 Feed Grain Program, sample farms in Corn Belt

Item and unit	Participants				Nonparticipants			
	All farms participating	Crop-share rented farms	Part crop-share rented farms	Other farms	All farms not participating	Crop-share rented farms	Part crop-share rented farms	Other farms
Total number of farms	821	212	194	415	624	117	127	380
Total farmland (acres per farm)	247.6	265.2	335.8	197.4	212.0	219.0	301.0	180.1
Total cropland (acres per farm)	191.5	219.8	269.7	140.5	157.8	172.4	236.4	127.0
Feed grain base (acres per farm)	96.6	112.1	139.1	68.9	65.1	80.4	95.2	50.3
Normal yield of corn (bushels per acre) 1/	63.7	66.1	62.1	63.1	61.4	63.7	58.6	61.6
1962 yield as a percentage of normal	124.5	123.7	127.7	123.1	125.1	124.3	128.0	124.5
Percentage of base diverted	32.6	26.8	31.3	38.6	---	---	---	---
Percentage of farms growing corn in 1962	87	98	97	77	98	99	98	97

1/ On farms growing corn in 1962.

farms and those that diverted their entire feed grain bases, thus raising the average percentage diverted.

The type of farm (classified according to the major source of net income) had little relationship to land use, yields, or the proportion of feed grain base diverted, except that farms with livestock had more permanent pasture and, consequently, a smaller proportion of land in crops (table 4). For participants, there was little difference among types of farms in acreage of cropland per farm, size of feed grain bases, normal yields, or 1962 corn yields. For both participants and nonparticipants, the proportion of farms growing corn in 1962 was lower for cash crop farms than for those with more livestock.

Some farmers participating in the program did not grow corn because they were not planning to grow corn in 1962, or because the diversion payment was more attractive than the profits from growing corn. About 13 percent of the participants did not grow any corn in 1962, compared with just over 2 percent of the nonparticipants. Normal yields averaged about 10 percent lower on farms that did not grow corn than on farms growing corn. The ratio was about the same for participants and nonparticipants.

Use of Cropland, 1962

As pointed out earlier, feed grain bases were a larger proportion of all cropland on participants' farms than on nonparticipants' farms. But after diverting part of their land to conserving uses under the program, participants had about 32 percent of their cropland in corn in 1962, compared with 43 percent for nonparticipants (table 5).

Participants also had less land in small grains, hay, and rotation pasture, but they had 17 percent of their cropland in soybeans, compared with 11 percent for nonparticipants. Crop-share rented farms used more of their cropland for corn in 1962 than owner-operated and other farms without crop-share rented land. This was true for both participants and nonparticipants, but the proportion was higher among participants.

Land use in 1962 by the three types of farms apparently was not related to participation. Among both participants and nonparticipants, cash crop farms had two-thirds to three-fourths of their land in corn, soybeans, and wheat, whereas livestock farms had nearly as much land in oats, hay, and rotation pasture as in cash crops.

In order not to exceed their permitted acreage of feed grains, participants underplanted an average of more than 4 acres per farm. This underplanting represents an adjustment in feed grain production without the usual cost to the Government for operation of the feed grain program. At the same time, nonparticipants planted an average of about 2 acres more than their bases. As participants in the Corn Belt outnumbered nonparticipants in 1962, the diversion without payment by participants was more than 3 times as great as the excess of plantings over base by nonparticipants.

Use of Diverted Acres

Participants in the feed grain program were required to apply approved conservation practices on the diverted acres. In most States

Table 4.--Size of farm, feed grain base, yields, and diversion, by type of farm and participation in 1962 Feed Grain Program, sample farms in Corn Belt

Item and unit	Participants				Nonparticipants			
	All farms participating	Cash crop farms	Livestock farms	Cash crop and livestock farms	All farms not participating	Cash crop farms	Livestock farms	Cash crop and livestock farms
Total number of farms	821	285	397	139	624	114	464	46
Total farmland (acres per farm)	247.6	230.1	253.8	266.0	212.0	171.9	221.0	220.8
Total cropland (acres per farm)	191.5	196.0	186.1	197.9	157.8	140.7	160.3	175.0
Feed grain base (acres per farm)	96.6	97.9	94.3	100.8	65.1	52.2	68.5	62.0
Normal yield of corn (bushels per acre) 1/	63.7	68.0	61.7	61.0	61.4	63.1	61.1	60.6
1962 average yield as a percentage of normal	124.5	128.2	123.2	119.5	125.1	127.9	124.1	128.3
Percentage of base diverted	32.6	32.0	33.0	32.8	---	---	---	---
Diversion payment per farm (dollars)	1,224	1,321	1,168	1,188	---	---	---	---
Percentage of farms growing corn in 1962	87	85	88	90	98	90	99	98

1/ On farms growing corn in 1962.

Table 5.--Distribution of cropland use, by tenure and participation in 1962 Feed Grain Program, sample farms in Corn Belt

Cropland use	Participants				Nonparticipants			
	All farms	Crop-share rented farms	Part crop-share rented farms	Other farms	All farms	Crop-share rented farms	Part crop-share rented farms	Other farms
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
All corn 1/	31.7	35.6	32.7	27.8	43.1	47.9	42.0	41.8
Corn harvested for grain 1/	30.8	35.2	31.8	26.3	40.9	46.3	40.0	39.2
Oats 2/	8.3	7.2	8.1	9.4	14.1	15.7	13.4	13.8
Wheat	3.7	4.2	4.3	2.7	3.6	3.0	4.9	3.1
Soybeans	17.4	23.4	18.3	11.7	11.4	13.0	14.8	8.6
All other crops	1.1	.6	1.7	.9	1.2	1.1	.9	1.1
Hay	11.7	8.3	10.0	16.0	14.3	11.1	12.4	16.9
Rotation pasture	7.6	5.8	6.7	9.8	10.1	7.3	8.4	12.4
Diverted acres (corn and wheat)	17.0	14.1	16.6	19.7	.3	.1	.4	.3
Idle and fallow	1.5	.8	1.6	1.9	1.9	.8	2.8	1.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1/ Includes sorghum, if any.
2/ Includes barley, if any.

and counties in the Corn Belt, the only approved practice was to seed the diverted acres to a cover crop, unless one was already established. Farmers were permitted to grow castorbeans, guar, safflower, sesame, or sunflowers on the diverted acres in lieu of diversion payments. However, none of the farmers in the sample chose this alternative. In a few counties, fallow operations were permitted as a means of destroying noxious weeds or for other purposes.

About 30 percent of the land designated as diverted acres already was in grass and a little less than 60 percent was seeded in 1962. Owner-operators were more successful than tenants in selecting fields with grass already established to be designated as diverted acres. These farms also had more of their cropland in hay and pasture (table 6).

Livestock on Farms

Livestock production was practiced more intensively on farms of nonparticipants than on participants' farms (table 7). More nonparticipants reported having livestock, and they had more livestock per farm and per crop acre. The total number of grain-consuming animal units (see footnote, table 7) averaged about a fourth larger. Grain-consuming animal units per crop acre averaged 0.70, compared with 0.45 for participants.

DIVISION OF PROGRAM PAYMENTS BETWEEN LANDLORDS AND TENANTS

The typical crop-share lease in the Corn Belt provides for equal division of the crop between landlord and tenant when the land is used to produce corn. Somewhat lower rents are provided for in a few leases. The crop-share rented farms included in the study reported that the landlord's share of the corn averaged slightly under half for both participants and nonparticipants (table 8).

Fixed costs associated with ownership and maintenance of the real estate are usually paid by landlords. Costs of owning and operating the machinery are usually paid by the tenants.

Most of the variable costs of production are borne by the tenant. But with the increased use of fertilizer, pesticides, field shellers, dryers, and crop insurance, new items have been added to the variable costs. Most of these new costs are shared by landlord and tenant, and thus the tenant's share of variable costs is declining toward half the total. There was little difference between participants and nonparticipants in the share of variable costs paid by landlords. Fertilizer cost is the largest item; typically half of this cost is paid by the landlord unless his share of the crop is less than half. The largest variable cost usually borne by the tenant is the cost of fuel, lubricants, and repairs for the machinery used in producing corn.

With participation in the feed grain program, fixed costs remain, but variable costs are reduced. As tenants usually pay most of the variable costs, participation in the program presumably is more profitable for tenants than for landlords unless some change is made in the division of payments. The division of payments on crop-share rented land under the program, however, does not show any significant change from the typical arrangement. On the 212 farms in the sample where all of the land was rented on a crop-share basis, tenants, on the average, received 51 percent

Table 6.--Percentage of diverted acreage with specified conservation practices, 1962 Feed Grain Program, sample farms in Corn Belt

Tenure of farm	Conservation practice: Left in established grass	Seeded or cover crop	Idle	Cultivated fallow
	Percent	Percent	Percent	Percent
Crop-share rented	25.7	64.3	5.1	4.9
Part crop-share rented	28.5	60.1	6.1	5.3
Other	34.8	50.9	7.6	6.7
All farms	29.8	57.7	6.7	5.8

Table 7.--Percentage of farms reporting livestock and numbers reported per farm, by participation in 1962 Feed Grain Program, sample farms in Corn Belt

Kind of livestock	Participants		Nonparticipants	
	Farms reporting	Average per farm reporting	Farms reporting	Average per farm reporting
	Percent	Number	Percent	Number
Milk cows, Jan. 1, 1963	39	10.9	48	13.2
Beef cows, Jan. 1, 1963	44	18.1	41	20.6
Fed cattle sold, 1962	36	38.9	39	43.3
Other cattle sold, 1962	45	13.6	48	15.4
Cattle pastured on contract, 1962	2	26.9	2	16.7
Cattle fed on contract, 1962	*	7.0	*	6.0
Ewes, Jan. 1, 1963	20	29.9	19	25.9
Fat lambs sold, 1962	17	50.0	16	47.0
Hogs raised, 1962	52	144	64	160
Feeder pigs sold, 1962	14	94	13	135
Feeder pigs bought, 1962	13	141	14	92
Total grain-consuming animal units 1/	---	87.0	---	110.6

1/ Weights used for converting livestock to grain-consuming animal units were: Milk cows on hand, 1.020; beef cows on hand, 0.167; fed cattle sold, 1.000; other cattle sold, 0.154; cattle pastured on contract, 0.080; cattle fed on contract, 1.020; ewes on hand, 0.022; fat lambs sold, 0.120; hogs raised, 0.712; feeder pigs sold, 0.332; feeder pigs bought, 0.380. Excludes poultry.

*Less than 1/2 of 1 percent.

Table 8.--Specified costs per acre of corn: Total amount and landlords' share, by participation in 1962 Feed Grain Program, sample farms in Corn Belt

Item	Participants		Nonparticipants	
	Total amount, all farms in sample	Landlords' share on crop leased land	Total amount, all farms in sample	Landlords' share on crop leased land
	Dollars	Percent	Dollars	Percent
Landlords' share of crop	---	48	---	47
Costs:				
Fertilizer	7.28	48	6.84	46
Insecticides and herbicides	.44	38	.28	36
Custom work	.62	19	.57	20
Crop insurance	.58	26	.47	27
Total	8.92	43	8.16	42

of the diversion payments. Similarly, on the 194 farms where part of the land was rented on a crop-share basis, tenants received 48 percent of the diversion payments on the rented land.

TAKING ADVANTAGE OF THE SPREAD BETWEEN SUPPORT AND MARKET PRICE

The 1962 Feed Grain Program offered price supports to participating farmers through nonrecourse loans from the Commodity Credit Corporation or by purchase agreements authorizing farmers to deliver grain to CCC and receive the local support price. If the support price was above the market price, this arrangement provided an advantage for the participant who had grain to sell.

A farmer could not take advantage of this provision on that part of his production that he fed to his livestock. He could, however, obtain the support price through a CCC loan, with his grain as security, and buy other grain for feed. Frequently this required providing additional storage space, the additional expense of buying grain, and the cost of transporting additional quantities of grain.

Farmers in the sample were asked to provide information on the total quantity of feed grain produced in 1962 and to estimate the quantity of grain they fed or would feed in the 12 months beginning October 1, 1962. For purposes of analysis, farmers were classified as surplus, in-balance, or deficit producers according to whether the quantity of feed grain they produced in 1962 was more, the same, or less than they fed or planned to feed in the 12-month period beginning October 1, 1962.

About 62 percent of the surplus producers participated in the 1962 Feed Grain Program, compared with 55 percent of the deficit producers and 36 percent of those who fed or planned to feed as much as they produced (table 9). Nearly 5 percent of the farmers interviewed neither grew nor fed any grain in 1962 and four-fifths of these were in the program.

For various reasons, such as needing money in the fall or underestimating the amount of feed needed in the summer, deficit producers may sell grain or surplus producers may buy grain. The normal amount of this buying and selling is indicated by the proportion of nonparticipants that sold and bought grain during the 1962-63 feeding season. Except for the effects of the program, similar proportions would be expected among participants. However, the proportions of sellers among deficit producers and buyers among surplus producers are higher for participants than for nonparticipants (table 10). These differences may be interpreted as the proportion of participants who took advantage of the excess of the support price over the market price of corn. Among participants, about 13 percent (21 minus 8, table 10) of deficit producers and 12 percent (33 minus 21, table 10) of surplus producers, or about an eighth of all participants, took advantage of the opportunity to profit by the spread between the support price and the market price of corn.

Farmers who sold their own corn and bought other grain for feed operated larger than average farms (table 11). Among deficit producers, those who sold feed grain produced nearly twice as much feed grain per farm as the average, and they also bought more. Purchases by participants, however, equaled 45 percent of production, compared with 28 percent for nonparticipants, thus indicating that the additional buying and selling activity may have been done to take advantage of the price differentials.

EFFECTS OF THE PROGRAM ON USE OF FERTILIZER

Although there are some differences between participants and nonparticipants with respect to the use of fertilizer, there is no evidence that the program pushed participants in the direction of cutting acreage and applying more fertilizer per acre.

Three-fourths of the corn acreage on participants' farms was fertilized in 1962, compared with 70 percent for nonparticipants (table 12). However, these proportions were computed after participants had reduced the acreage of corn on their farms.

A slightly different perspective is obtained from comparing the percentages of feed grain base acreage used to grow fertilized corn by the two groups; participants grew fertilized corn on 46 percent of their base acreage, compared with 72 percent for nonparticipants.

Fertilizer was used more intensively on cash-crop farms than on those with more income from livestock. In 1962, 80 percent of the corn acreage on cash crop farms was fertilized. The figure was the same for participants and nonparticipants. The quantity of plant food applied per acre of corn also was highest on cash crop farms and averaged about the same for participants and nonparticipants.

The quantity of fertilizer applied per acre rose slightly from 1961 to 1962, in line with the long-time trend. The increase varied somewhat among types of farms, but it averaged about the same for participants and nonparticipants.

Table 9.--Surplus, in-balance, deficit, and other producers participating in 1962 Feed Grain Program, sample farms in Corn Belt

Class of producer 1/	Farms in sample		Proportion participating in the program
	Number	Percentage of total	
		Percent	Percent
Surplus producers	786	54	62
In-balance producers	244	17	36
Deficit producers	349	24	55
No grain produced or fed in 1962	66	5	79
All farms in sample	1,445	100	57

1/ See text for definition of classes.

Table 10.--Deficit producers selling, and surplus producers buying, feed grains, by participation in 1962 Feed Grain Program, sample farms in Corn Belt

Item	Proportion of participants	Proportion of nonparticipants
	Percent	Percent
Deficit producers selling grain	21	8
Surplus producers buying grain	33	21

Table 11.--Production, purchases, and sales of feed grain by deficit producers who sold feed grain, by participation in 1962 Feed Grain Program, sample farms in Corn Belt 1/

Item	Participants		Nonparticipants	
	Deficit producers selling corn	All deficit producers	Deficit producers selling corn	All deficit producers
	Number			
Producers	40	192	12	157
	Bushels 2/			
Feed grain production per farm	7,161	3,536	9,917	5,135
Feed grain fed per farm	9,359	5,558	12,086	6,815
From 1962 crops	5,183	3,124	8,651	5,038
Purchased	4,176	2,434	3,435	1,777
Feed grain sold	1,978	412	1,266	97

1/ A deficit producer is one who bought or planned to buy, from October 1, 1962, to September 30, 1963, more feed grain than he sold or planned to sell from the 1962 crop.
2/ Bushels of corn equivalent.

Table 12.--Use of fertilizer on corn, 1961 and 1962, by type of farm and participation in 1962 Feed Grain Program, sample farms in Corn Belt

Item	Unit	Participants				Nonparticipants			
		All farms	Type of farm			All farms	Type of farm		
			Cash crop	Livestock	Cash crop and livestock		Cash crop	Livestock	Cash crop and livestock
Farms in sample	Number	821	285	397	139	624	114	464	46
Farms growing corn, 1962	Percent	87	85	88	90	98	90	99	98
Corn per farm growing corn, 1962	Acre	68	74	65	66	69	59	70	70
Percent of acreage fertilized, 1962	Percent	75	80	68	77	70	80	70	71
Percentage of base acreage used for fertilized corn, 1962	Percent	46	---	---	---	72	---	---	---
Plant nutrients per acre fertilized:									
1961									
N	Pounds	38	48	33	32	34	43	31	40
P_2O_5	do.	31	34	30	26	29	37	28	28
K_2O	do.	23	27	21	19	25	35	23	25
Total	do.	92	109	84	77	88	115	82	93
1962									
N	do.	42	55	35	35	37	46	34	45
P_2O_5	do.	31	35	30	27	30	36	28	33
K_2O	do.	23	29	21	18	26	35	23	26
Total	do.	96	119	86	80	93	117	85	104

PROFITABILITY OF PARTICIPATION

Budgets based on average or typical farm situations in the Corn Belt usually show that participation in the feed grain program would be profitable. Many farms, however, are not "average" or "typical." For some of these, participation may not be profitable, and could, in fact, reduce their incomes appreciably. Others may be participating, but may divert more acreage than the amount that would maximize their incomes.

Budgets were prepared for each participant and nonparticipant farm in the sample. The analysis was limited to a comparison of returns from the acreage planted to feed grains and diverted on participants' farms and the feed grain base acreage on nonparticipants' farms. A few farms, because of small feed grain bases or for other reasons, did not participate in the program and their feed grain acreage in 1962 greatly exceeded their bases; these farms were excluded from the analysis because no meaningful comparison could be made. However, the 1962 corn acreage on most nonparticipant farms did not exceed their bases; their 1962 acreage averaged less than 3 percent more than their base acreage.

The data on acreages, yields, and some cost items were obtained from interviews with farmers. It was necessary, however, to estimate prices that farmers might expect to receive if they sold their corn and the variable cash costs incurred in operating their machinery.

Price Assumptions

The support price available to farmers in the study area ranged from $1.24 a bushel in Seneca and Wyandot counties in Ohio to $1.09 a bushel in Miner County, S. Dak. The estimated market price available to participants for production above normal yields and to nonparticipants ranged from $1.03 to $0.88 a bushel. For the area as a whole, the support price averaged $1.18 a bushel for the 1962 corn crop and the assumed market price from October 1, 1962, to September 30, 1963, averaged $0.98 a bushel.

In retrospect, it now appears that the assumed market price may have been too low. It was based on the relation of market price to support price in 1961. However, during the 1962 market season, the market price of corn rose much more than it did in 1961. If a higher market price had been used in the profitability analysis, the results would have shown that nonparticipation was the more profitable alternative for more farmers.

Production Costs

For this analysis, only variable cash costs were considered relevant. Some of the cost data used in estimating the profitability of participation were obtained from farmers. They included cash costs of fertilizer, spray materials, and custom work hired. These costs could, and did, vary considerably among farms. Other costs, such as the cash costs of operating machinery and seed costs, were estimated and assumed to be the same for all farms. Seed cost was estimated at $2 an acre. Cash costs of operating machinery for preharvest operations were estimated to be $2.60 an acre. This estimate was selected after consulting farm management specialists in the eight States.

At first, the intention was to use different costs for each State, or perhaps for smaller areas than an entire State. But after adjusting for differing assumptions or methods of estimating, little difference in the estimates was found and it was decided that using the same estimates for the entire study area was justified. Estimates of the costs of harvesting corn by different methods were also prepared. Farmers reported methods of harvesting and sizes of machines used. A uniform variable cash cost of $1.35 an acre was charged for all corn picked and cribbed with the farmer's own equipment. Similarly, a uniform charge of $3.10 per acre was made for field picking and shelling, including $1.80 an acre for drying. All corn custom-harvested by picker-shellers was assumed to require drying and a charge of $1.80 an acre was made for this service. Charges were made for the acres picked by custom operators at the rates reported by each farmer.

Costs of material and hired services used in the production of corn varied widely from farm to farm. The largest single item usually was the cost of fertilizer. This varied from zero to about $15 per acre. The average cost for fertilizer used by participants was $7.28 per acre of all corn. The comparable cost for nonparticipants was $6.84 per acre. On the average, fertilizer costs comprised more than 80 percent of the costs of all materials and hired services.

The cost of seeding and/or maintaining the diverted acres also varied widely among farms. About 30 percent of the diverted acres was land left in established sod, and on this land the maintenance cost was low. Another 13 percent was left idle or in cultivated fallow. The average cash expenditure for maintaining diverted land not seeded to a cover crop was $0.80 an acre. On the 57 percent of the diverted acres seeded to a cover crop, the total cash cost per acre was $6.79. This included $4.85 an acre for seed, fertilizer, lime (if any), and other materials, and $1.94 for cash costs of operating tillage, seeding, spraying, and mowing machinery. On crop-share rented land, landlords paid 58 percent of the cost of materials. It was assumed that tenants paid all the machinery costs on diverted acres. Farmers may have been reimbursed under the Agricultural Conservation Program for part of the cost of seeding diverted acres. However, the data on ACP payments obtained in the survey were incomplete, and therefore, not suitable for making reliable estimates. If these payments had been included, farmers' costs would have been somewhat lower than those reported.

Profitability Analysis

Four situations were considered in analyzing returns from the feed grain program: (1) Net returns were estimated for the feed grain base on each farm in the program including returns from production and from Government payments. (2) Net returns also were estimated for each participant farm as if it had not been in the program and its entire base were planted to corn. (3) Similarly, net returns were estimated for the feed grain base acreage on each nonparticipating farm. (4) Net returns were estimated for these farms assuming they had participated in the program. The profitability of each situation is expressed as the return above variable cash costs divided by the acreage in the feed grain base.

Participants

For farms in the program, gross return was computed as the normal production (acres grown times normal yield, if normal yield was equal to or less than actual yield) valued at the local support price, plus excess production (the excess of actual yield over normal yield, if any, times acres grown) valued at the local market price, plus the diversion payment. Net return was estimated as gross return less the variable cash costs of production. These costs included fuel, oil, machinery repairs, seed, fertilizer, insecticides, herbicides, custom application of chemicals, and custom harvesting of corn, and similar costs of machinery operations and materials used in seeding and/or maintaining the diverted acres.

Estimation of returns was possible only for those farms that grew corn for grain. About 86 percent of the participants and 97 percent of the nonparticipants harvested corn for grain in 1962.

If Participants Had Not Participated

In estimating what production costs would have been on participants' farms if they had not participated, it was assumed that the proportion of the additional acreage fertilized or sprayed was the same as for the acreage grown, and the fertilizer and spray materials were applied at the same rate as on the acreage grown. Furthermore, the method of harvesting the additional acreage was assumed to be the same as the method used on the actual acres grown, except that if any acreage was custom harvested, it was assumed that all additional acreage also was custom harvested.

Nonparticipants

The acreage used for comparison on the nonparticipant farms was equal to the farm's feed grain base. Preharvest machinery and seed costs and cost per acre for harvesting with the farmers' own equipment were assumed to be the same as for participants. Yields and rate of application of fertilizer and other chemicals were those reported by each farmer.

If Nonparticipants Had Participated

For purposes of comparison, it was assumed that if a nonparticipant had participated in the feed grain program he would have diverted the minimum acreage required for eligibility (20 percent of his base). This left 80 percent of the base to be grown. Cost rates were the same as for nonparticipation. In estimating harvesting costs under participation, if any acreage had been custom harvested it was assumed that the cost of custom harvesting would be reduced first before reducing the cost of harvesting with owned equipment.

The Results of the Analysis

Profitability of participation was measured as returns above variable cash costs per acre from participation less similar returns from nonparticipation. Based on the method and assumptions stated earlier, participation was the more profitable alternative for 65 percent of all farmers. Participation was more profitable than nonparticipation for 49 percent of participants and would have been more profitable than nonparticipation for 83 percent of nonparticipants (table 13).

For about 5 percent of each group, returns from participation and nonparticipation were about equal. The proportion of farms for which participation was profitable was highest among rented cash-crop farms. This is also the group that included the highest proportion of participants (table 2). Among nonparticipants, participation in the program would have been profitable for a higher proportion of rented farms and for cash-crop farmers than for other tenure and type-of-farm groups.

Table 13.--Farmers for whom participation in 1962 Feed Grain Program was (or would have been) more profitable than nonparticipation, sample farms in Corn Belt

Tenure and type of farm	Participants	Nonparticipants
	Percent	Percent
All farms	49	83
Tenure of farm:		
All crop-share rented	60	86
Part crop-share rented	49	80
All other	43	83
Type of farm:		
Cash crop	53	84
Livestock	47	83
Cash crop and livestock	49	76

The difference in returns per acre from participation less nonparticipation ranged from a loss of $64 an acre to a gain of $17 an acre (fig. 2). The difference in returns is associated with the ratio of normal yields to actual yields. Yields rose sharply from 1959-60 (the base period for normal yields) to 1962. Many farmers found participation relatively unprofitable because actual yields were much higher than they had expected. On the 10 percent of farms for which participation was least profitable, normal yields averaged 34 percent below actual 1962 yields. However, on the 10 percent of participant farms for which participation was most profitable, normal yields averaged 8 percent above 1962 yields. It was not possible to judge from the data whether normal yields on these farms were too high or actual yields were abnormally low due to hail, drought, flood, or other natural calamities.

With the yields obtained in 1962 and the prices and costs assumed in this analysis, farmers diverted more acreage than the amount that would maximize returns. For most farmers, returns would have been highest with 20 percent of their base acreage diverted--the minimum necessary to qualify for price support. On the average, a participant's returns above cash costs were $58 an acre. However, because yields were much higher than anticipated, returns per acre would have averaged $67 if all farmers had diverted only the minimum acreage, compared with an estimated $63 an acre if they had all stayed out of the program.

In comparing returns of nonparticipants with what they might have earned as participants, it was assumed that they would have participated at the minimum level of 20 percent of the base diverted. This differs

PROFITABILITY OF PARTICIPATION IN THE
1962 FEED GRAIN PROGRAM

(Difference in Net Return Per Acre - Participation Less Nonparticipation)

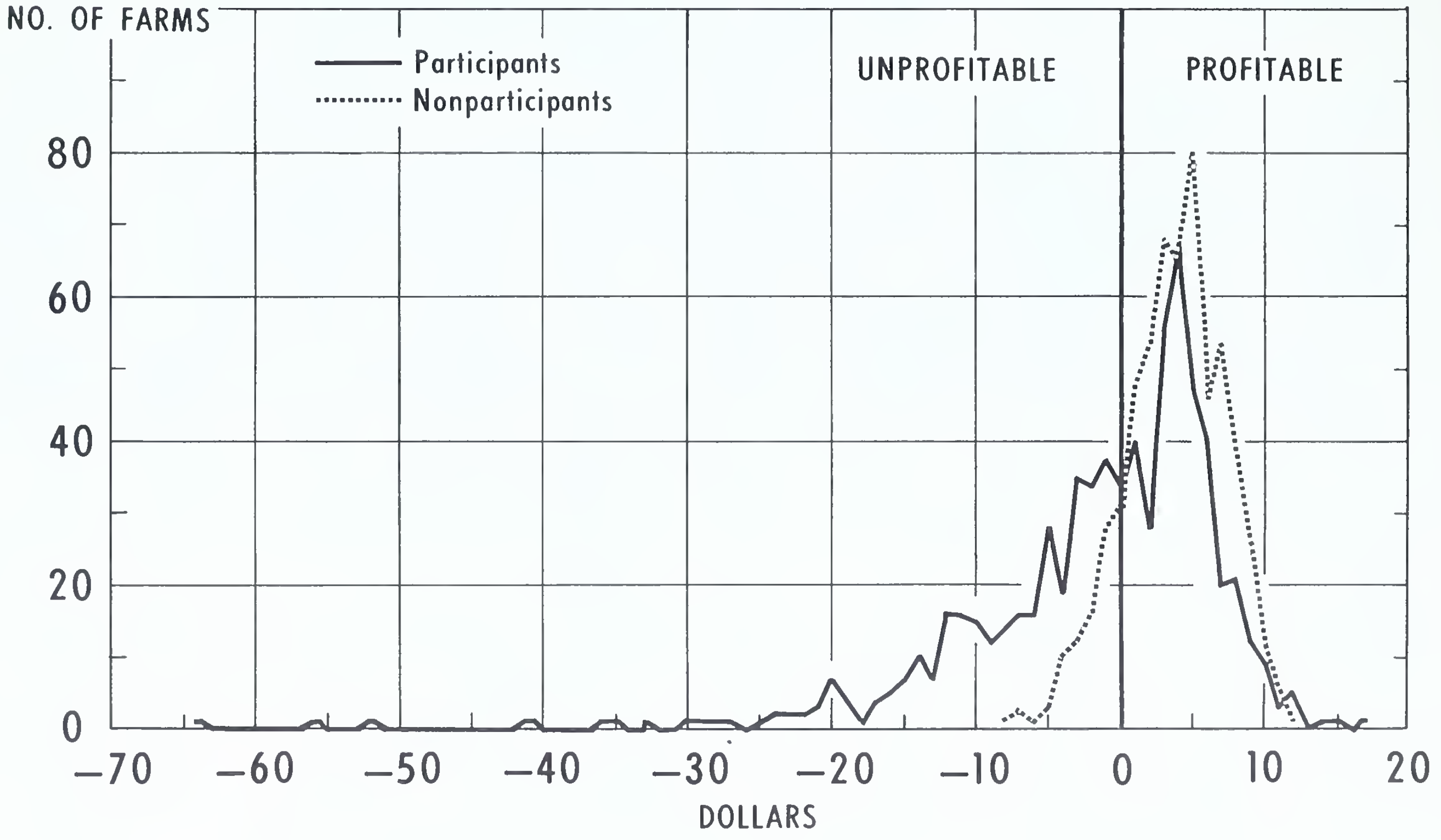

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Figure 2

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from the actual diversion on participants' farms of 33 percent of the base and accounts for a large part of the difference in the proportion of participants and nonparticipants for whom participation was or would have been profitable. Adjusting diversion on farms in the program to the minimum raised, the returns from participation by $9 an acre (from $58 to $67) and the proportion of participants for whom participation was profitable rose from 49 percent to 82 percent, or the same as the proportion of nonparticipants for whom participation would have been profitable with minimum diversion.

As stated earlier, the proportions of farms for which participation was, or would have been, more profitable than nonparticipation was based on the assumption that the market price of corn would average $0.20 per bushel below the support price. In retrospect, it appears that the market price was only about $0.12 per bushel below the support price. The assumption of a 12-cent differential would have made participation profitable for only about 10 percent of the farms.

With yields on participants' farms averaging 79.3 bushels per acre, an additional 8 cents per bushel would add an average of $6.34 per acre for each acre of corn grown. This amount, added to the returns above cash costs for nonparticipation, would reduce the number of participants for whom participation was profitable from the adjusted 82 percent described above to 69 percent.

Among nonparticipants, the percentage for which participation would have been more profitable, with the smaller spread between support price and assumed market price for corn, would be reduced from 83 to 23 percent. The range in the difference between actual and hypothetical returns was much smaller for nonparticipants than for participants. Thus, adding about $6 per acre to returns from nonparticipation reduced the potential profitability of participation for a large number of farms.

Because the program reduced variable costs, and tenants pay most of the variable costs and landlords' costs are largely fixed costs, it was assumed that the program would tend to be more profitable for tenants than landlords. Although the analysis shows that the program favored tenants, the advantage for tenants generally was small. On the 208 tenant-operated sample farms in the program, the tenants received 47 percent of the net returns above variable cash costs. If the farms had not been in the program, tenants would have received 46 percent of the net returns.

Another way of measuring relative returns to tenant operators and landlords is the proportion of each group for whom participation was more profitable than nonparticipation. Participation in the program was the more profitable alternative for 68 percent of the tenant operators compared with 54 percent of their landlords.